REMARKS

Claims 1-29 are pending in the application. With this amendment, claims 1, 3-11 and 13-29 have been amended to further define the invention. Claims 2 and 12 have been canceled and the subject matter thereof added to the respective independent claims. Claims 30 and 31 have been added.

Claims 1-29 have been provisionally rejected under the judicially created doctrine of obviousness-type double patenting as being unpatentable over claims 1-29 of copending Application No. 11/030,243 to Patel et al. The Examiner states that although the conflicting claims are not identical, they are not patentably distinct from each other because the specific polymer to which the thermoplastic vulcanizate as recited herein would be embraced by the resins of the presently claimed invention.

In order to overcome the double patenting rejection, a Terminal Disclaimer is submitted herewith signed by an officer of the Assignee. Likewise, a proper statement under 37 C.F.R. § 3.73(b) showing Assignee's ownership of both applications is submitted herewith. Notice of acceptance of the Terminal Disclaimer is earnestly solicited.

Claims 1-29 have been rejected under 35 U.S.C. §103(a) as being unpatentable over Coran et al. U.S. Patent No. 4,104,210 (hereinafter Coran '210), Coran et al. U.S. Patent No. 4,141,878 (hereinafter Coran '878), or Shimizu et al. U.S. Patent No. 5,310,800. Claims 1-3, 5-7, 11-13, 15-17, 21 and 22 have been rejected under 35 U.S.C. §103(a) as being unpatentable over Coran et al. U.S. Patent No. 4,130,535 (hereinafter Coran '535).

Regarding Coran '210, the Examiner states that the reference teaches broadly the employment of a thermoplastic vulcanizate resin blend composition with other thermoplastic polyolefin resins in column 7, lines 11-21. Regarding Coran '878, the Examiner states the reference teaches broadly the employment of a thermoplastic vulcanizate resin blend composition with other thermoplastic polyolefin resins in column 6, lines 28-40. The Examiner further states that the Shimizu reference teaches broadly the employment of a thermoplastic vulcanizate resin blend composition with other thermoplastic polyolefin resins in column 11, Example 3. The Examiner states that the Coran '535 reference teaches broadly the employment of a thermoplastic vulcanizate

resin blend composition with other thermoplastic polyolefin resins in column 7, lines 41-54. Accordingly, the Examiner states that the claims of the present invention would be obvious to one of ordinary skill in the art.

It is respectfully submitted that the cited references cannot teach or suggest the present invention as claimed, alone or in combination. The present invention claims methods and compositions relating to toughened polymer compositions. As disclosed in the Summary of the Invention, beginning on page 2, the toughened polymer compositions are physical blends of a thermoplastic polymer component and a thermoplastic elastomer or vulcanizate component. The elastomer component is prepared by dynamically vulcanizing a rubber component in the presence of a matrix polymer prior to blending with the thermoplastic polymer component. The prior art references teach only the preparation of elastomers. Likewise, the claims of the invention are directed to toughened polymer compositions having lower amounts of oil, which cannot be taught or suggested by the prior art.

Unexpectedly, the toughened polymer compositions are impact resistant when compared to thermoplastic polymer compositions containing an uncrosslinked rubber component. One of ordinary skill in the art would expect that adding a thermoplastic elastomer component, generally considered a rubbery or soft compound, to a thermoplastic polymer component would decrease impact resistance and hardness of the polymer.

With respect to rotationally molded articles and methods utilizing rotational molding, it has been unexpectedly found that the toughened polymer compositions are suitable for producing the same. As stated on page 16, third full paragraph, the toughened polymer compositions when rotationally molded, produce parts having high surface quality with excellent hardness as well as impact strength. During rotational molding, polymeric compositions are subjected to relatively high temperatures for extended periods of time when compared to injection molding. It is known to the art that uncured rubber-containing compositions are not suitable for rotational molding as the rubber is not stable during the extended period of molding time. For example, impact polystyrene and ABS produce rotationally molded articles having poor surface quality due to the instability and degredation of the rubber-like components of the

compositions. Heretofore, uniform melt flow could not be obtained, thus producing rotationally molded articles with irregular and rough surfaces, etc. It has been found that the vulcanized thermoplastic elastomer component of the toughened polymer blend having the defined particle size allows rotationally molded articles to be produced having excellent surface quality.

The Coran '210 reference relates to thermoplastic elastomer compositions that specifically teach away from Applicants' claimed toughened polymer composition. Independent claims 1 and 11 have been amended to state, along with independent claim 21, that the rubber component is present in an amount from about to 2 to about 60 parts per 100 parts by weight of the matrix polymer and the thermoplastic polyolefin component. Thus, the toughened thermoplastic composition contains less than about 37.5 parts of the rubber component per 100 parts by weight of the rubber component of the thermoplastic elastomer component, matrix polymer of the thermoplastic elastomer component, and thermoplastic polyolefin component. Antipodially, the Coran '210 reference teaches utilizing at least 55 parts by weight of rubber per 100 parts by weight of polyolefin resin and rubber, see column 1, lines 45-46. Coran '210 further states in column 1, lines 60-63, "When the quantity of rubber falls below about 55 parts by weight per 100 parts by weight resin and rubber combined, hard, rigid compositions having reduced toughness are obtained." Accordingly, the Coran '210 reference specifically teaches away from Applicants' claimed methods and compositions which contain less than 37.5 parts of rubber per 100 parts by weight of rubber, matrix polymer and thermoplastic polymer, and unexpectedly have excellent hardness and toughness values as shown in the Examples. It would be counterintuitive for one of ordinary skill in the art to consider the Coran '210 reference and arrive at Applicants' claimed invention.

Likewise, the Coran '878 reference teaches away from Applicants' toughened polymer compositions and methods comprising the rubber component in an amount from about 2 to about 60 parts per 100 parts by weight of the matrix polymer and the thermoplastic polyolefin component. Coran '878 relates to thermoplastaic elastomers of CSM rubber and polyolefin. As stated in column 2, lines 32-38 of Coran '878, "When the quantity of cross-linked CSM rubber, in the absence of plasticizer falls below about 50 parts by weight per 100 parts total weight of polyolefin resin and CSM rubber, or

when the quantity of polyolefin resin exceeds 50 weight percent of the composition, hard, rigid compositions having reduced toughness are obtained". Accordingly, one of ordinary skill in the art would not be led in the direction the Applicants have taken to produce a toughened thermoplastic composition and arrive at methods for preparing or utilizing the same as claimed.

It is respectfully submitted that the Shimizu reference cannot teach or suggest Applicants' claimed thermoplastic composition or methods for producing or utilizing the same, wherein the toughened thermoplastic composition includes a thermoplastic polyolefin component, and a thermoplastic elastomer component derived from a rubber component cross-linked in the presence of a matrix polymer. As pointed out by the Examiner, in column 5, lines 36-64, Shimizu merely teaches preparation of a thermoplastic elastomer which is prepared by blending (a) 10 to 100 parts by weight an olefin copolymer rubber, and (b) 0 to 90 parts by weight of an olefinic plastic along with optional additives as listed therein. Column 6, lines 35-39 and column 7, lines 43-54, relate to the production of the thermoplastic elastomer. Example 3 in column 11 cited by the Examiner does not relate to blending a thermoplastic polyolefin component with a thermoplastic elastomer component as claimed. Example 3 can only teach preparation of a thermoplastic elastomer prepared utilizing 50 parts of EPDM (rubber) and 50 parts of polypropylene (thermoplastic) and curing the mixture utilizing peroxide to form an elastomer composition as stated in line 40. There is no teaching for Applicants' specifically claimed toughened polymer compositions and methods.

Likewise, the Coran '535 reference relates to the production of a thermoplastic vulcanizate as cited by the Examiner in column 2, lines 1-19 and line 53, as well as column 3, line 26 and column 5, lines 7-47. Furthermore, column 7, lines 41-54 relate to the preparation of the thermoplastic vulcanizate. It is respectfully submitted that only hindsight motivation can be utilized to reject Applicants' claimed processes and toughened polymer compositions comprising the thermoplastic elastomer component blended with the thermoplastic polyolefin component, wherein the rubber component is present in an amount from about 2 to about 60 parts by weight per 100 parts by weight of the matrix polymer and thermoplastic polyolefin polymer component, as well as containing less than 20 parts by weight of extender oil per 100 parts by weight of the

rubber component. As stated in column 6 of Coran '535, lines 26-30, 30 to 250 parts by weight of extender oil are added per 100 parts by weight of rubber present in the vulcanizate blend with quantities of about 70 to 200 parts by weight of extender oil per 100 weights by weight of rubber being preferred.

It is respectfully submitted that the claims are in condition for allowance and a Notice of such is earnestly solicited. Should the Examiner have any questions or concerns regarding this response, a telephone call to the undersigned is greatly appreciated in order to expedite allowance of the application.

Respectfully submitted,

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